

Data

Mg REACTION DATA - Part I

- Mass of 1 meter of Mg ribbon: 1.10 grams
- a. Volume of HCl used: 100 mL
- b. Length of Mg ribbon used: 100 cm
- c. The initial temperature of the HCl: 21.3 °C
- d. The final temperature of the HCl + Mg: 66.2 °C

MgO REACTION DATA - Part II

- e. Volume of HCl used: 100 mL
- d. Mass of MgO: 2.20 g
- h. The initial temperature of the HCl: 21.3 °C
- i. The final temperature of the HCl + MgO: 39.4 °C

Calculations

PART I - Mg

1. Calculate the heat energy, q , released by the reaction of Mg and HCl using the combined mass of all the reactants.
2. Calculate the enthalpy of this reaction, ΔH_{rxn} , in kJ/gram using the grams of Mg.
(Note the sign of ΔH_{rxn} in your answer).
3. Calculate the enthalpy of this reaction, ΔH_{rxn} , in kJ/mol using the molar mass of Mg.
(Note the sign of ΔH_{rxn} in your answer).

PART II - MgO

4. Calculate the heat energy, q , released by the reaction of MgO and HCl using the combined mass of all the reactants.
5. Calculate the enthalpy of this reaction, ΔH_{rxn} , in kJ/gram using the grams of MgO.
(Note the sign of ΔH_{rxn} in your answer).
6. Calculate the enthalpy of this reaction, ΔH_{rxn} , in kJ/mol using the molar mass of MgO.
(Note the sign of ΔH_{rxn} in your answer).

More Calculations

7. Use Hess' Law to demonstrate how the three equations listed in the introduction are used to determine the heat of formation of MgO. Then calculate the heat of formation of MgO.
8. The accepted value for (Eqn.1) is -462 kJ/mol Mg. Calculate your % error.
9. The accepted value for (Eqn.2) is -146 kJ/mol MgO. Calculate your % error.
10. The accepted value for ΔH_f is -602 kJ/mol MgO. Calculate your % error.